



**Course:** PHYS 522  
**Term:** Spring 2022  
**Room:** BRK 103  
**Class:** TTH 2:30-3:45PM

## **INSTRUCTOR CONTACT INFORMATION**

**Instructor:** Peter Nordlander  
**Office:** BH 308  
**Email:** nordland@rice.edu  
**Office Hours:** After consultation

**Grader:** TBA

**Due to Covid, the initial classes will be on zoom: Meeting ID: 997 1936 5391; Passcode: 818939**  
**<https://riceuniversity.zoom.us/j/99719365391?pwd=MEFDQkZBWjZ2WkVoOGI2dVlGNmFjUT09>**

## **COURSE OBJECTIVES AND LEARNING OUTCOMES**

Quantum Theory of Radiation; Coherent and Squeezed States; Quantum Distribution Theory; Field-Field and Photon-Photon Interferometry; Atom-Field Interaction: Semi classical Theory; Atom-Field Interaction: Quantum Theory; Quantum Theory of Damping; Resonance Fluorescence; Quantum Theory of the Laser; Squeezing via nonlinear optical processes; Atom Optics; EPR; Hidden Variables; Bell's Theorem; Quantum nondemolition measurements; Quantum Plasmonics; Electromagnetically Induced Transparency, Super radiance; Lamb shift

## **REQUIRED TEXTS AND MATERIALS**

Quantum Optics by M.O. Scully and M.S. Zubairy, Cambridge

## **EXAMS AND PAPERS**

Final Oral Exam

## **GRADE POLICIES**

The grade is determined from the homework (80%) and the final exam (20%).

## **ABSENCE POLICIES**

The students should try to attend class since the lectures include material beyond the book

## **RICE HONOR CODE**

In this course, all students will be held to the standards of the Rice Honor Code, a code that you pledged to honor when you matriculated at this institution. If you are unfamiliar with the details of this code and how it is administered, you should consult the Honor System Handbook at <http://honor.rice.edu/honor-system-handbook/>. This handbook outlines the University's expectations for the integrity of your academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process.

## **DISABILITY SUPPORT SERVICES**

If you have a documented disability or other condition that may affect academic performance you should: 1) make sure this documentation is on file with Disability Support Services (Allen Center, Room 111 / [adarice@rice.edu](mailto:adarice@rice.edu) / x5841) to determine the accommodations you need; and 2) talk with me to discuss your accommodation needs.

## **SYLLABUS CHANGE POLICY**

This syllabus is only a guide for the course and is subject to change with advanced notice.